

ABSTRACT OF THE DISCLOSURE

A model based framework utilizing a vector of multiple material states integrates nondestructive evaluation methods that provide observability of precursor and damage states with health control actions to reduce sustainment costs and extend component lifetimes. This evaluation includes usage monitoring and onboard diagnostics to ensure damage state observability. With an adaptive damage tolerance model, a set of precursor and damage states are assumed. Monitoring of precursor states, early damage detection, and observable health control actions, combined with onboard diagnostics, permit reduced costs and ensure readiness.